New York State Integrated Pest Management Program

Using Honey Bees to Disseminate *Trichoderma harzianum* to Strawberries for *Botrytis* Control

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INTRODUCTION

Over the last few years, several studies have successfully shown that honey bees can disseminate beneficial fungi, bacteria, and viruses to strawberries, pome fruits, and clover respectively. From 1994 through 1996 we conducted tests at the New York State Agricultural Experiment Station (NYSAES) that showed that bumble bees and honey bees could successfully disseminate the spores of the fungal antagonist, *Trichoderma harzianum*, to strawberry flowers for *Botrytis* fruit rot control.

Botrytis cinerea causes the familiar gray molds that are evident on a variety of fruits including grapes, strawberries, and raspberries. Infection by *B. cinerea* on strawberry occur in the flower, and remain quiescent until the fruits mature, and then develop abundantly, causing fruit rot and covering the fruit with hyphae and spores. Current IPM recommendations call for one to two fungicide applications at bloom, depending on variety, bloom length, and weather conditions, for control of this pest.

T. harzianum strain 1295-22 is a Cornell patented fungal biological control agent. It was produced by protoplast fusion and has efficacy against a wide range of plant pathogenic fungi including, *B. cinerea* . This strain, and some formulations based on it, have been registered with the Environmental Protection Agency. Toxicity testing on vertebrate species indicated no pathogenic or toxic effects, and the EPA has granted an exemption from tolerance for this strain. A company, Bioworks Inc., Geneva, NY, is beginning to manufacture large quantities of this biocontrol agent .

Results from our earlier tests have not only shown that plant protection benefits can be achieved through the use of bees as disseminators of biologicals, but yields can also be increased by the present of these pollinators. Although strawberries are primarily gravity or wind pollinated, about 20% of the flowers are pollinated by insects. Previous studies by other authors indicated that strawberry fruit weight can be increased from 18 - 26% by adding hives to strawberry fields. Results from our studies also showed fruit weight increases of between 25-35%. This increase is primarily due to more seeds per fruit because of better pollination.

The objective of this experiment was to demonstrate on grower farms the use of honey bee delivered *Trichoderma harzianum* (T22 formulation) for the control of *Botrytis* fruit rot on strawberries.

For a printed copy of the entire report, please contact the NYS IPM office at:

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